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Indian Standard
SPECIFICATION FOR SPRING BALANCES
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 31 March 1967, after the draft finalized by the Commercial Weights and Measures Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 This standard was first published in 1960. The present revision has been taken up to accommodate the requirements of milk balances and balances having the pan above.

0.3 With a view to allowing improvements in general design, the manufacturers may use any material for the body of the balance and the pans as specified in **4.3** and **4.4**. It is, therefore, necessary that the indentor should indicate the material required by him and the manufacturer supply this information while answering a query.

0.4 In determining the limits for maximum error, due consideration has been given to the views of manufacturers and testing organizations, prevalent rules and regulations pertaining to weights and measures in India and the practices current in several metric countries. It is to be pointed out that the values of maximum error specified in this standard are applicable to new machines only.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for spring balances of hanging and 'pan above the balance' types having capacity of 1 to 500 kg.

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*Rules for rounding off numerical values (*revised*).

2. DEFINITIONS

2.1 Spring Balance — For the purpose of this standard, a spring balance shall mean an instrument which on the application of the load to be weighed, indicates the whole weight by the extension or compression of a spring, such extension or compression being indicated by means of a pointer on a dial.

2.2 The general arrangement for hanging type spring balance is illustrated in Fig. 1.

2.3 The general arrangement for spring balance of pan above the balance type is illustrated in Fig. 2.

3. CAPACITIES

3.1 The capacities and permissible errors of indication for spring balance shall be as specified in Table 1.

TABLE 1 TOLERANCES AND MAXIMUM ERRORS RECOMMENDED FOR SPRING BALANCES

(*Clauses* 3.1 *and* 4.7.1)

Capacity (1)	Maximum Weight Corresponding to Interval Between Consecutive Graduations (2)	Maximum Error (3)	Remarks (4)
1 kg	5 g	A weight corresponding to 25 percent of the interval between successive graduations	While fixing the diameter of effective circle on dial of one revolution, a blank space of minimum 15 mm at the end of graduations shall be provided. The minimum blank space requirement shall not apply, in the case of multi-revolution spring balances.
2 kg	20 g		
5 kg	20 g		
10 kg	50 g	A weight corresponding to 50 percent of the interval between successive graduations	
15 kg	50 g		
20 kg	100 g		
30 kg*	100 g		
50 kg	200 g		
100 kg	500 g		
150 kg	1·0 kg		
200 kg	1·0 kg		
300 kg*	1·0 kg		
500 kg	2·0 kg		

*Non-preferred.

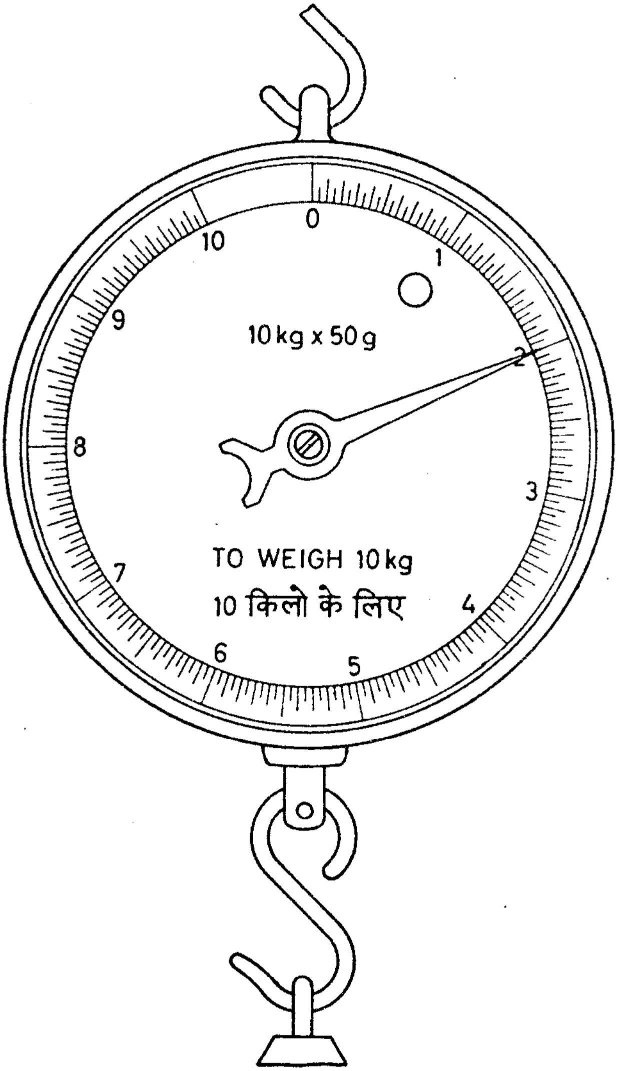

Fig. 1 Spring Balance, Hanging Type

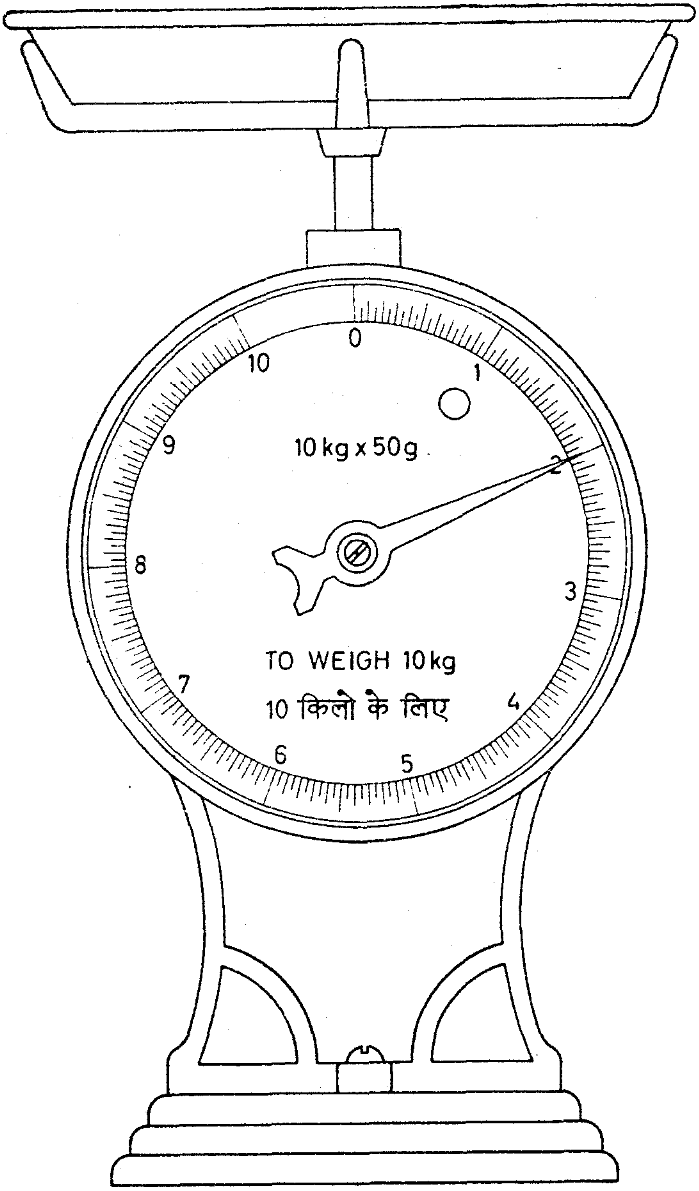

Fig. 2 Spring Balance of Pan Above Balance Type

4. GENERAL REQUIREMENTS

4.1 The balances shall comply with the general requirements specified in IS : 1432-1959*. In addition, they shall comply with the requirements given in **4.2** to **4.9**.

4.2 In spring balances of hanging type, the spring shall be suspended from a stand, support or bracket.

4.3 The body of the spring balances shall be constructed of aluminium, brass, cast iron, mild steel or any other suitable material and shall be sufficiently robust in construction.

4.4 If receptacles or pans are provided for the balance, they shall be made of aluminium, brass, bronze, cast iron, mild steel or stainless steel. Metal chains or metal supports shall be provided if the pans are suspended. When the pan is manufactured from mild steel, it shall be suitably protected against corrosion.

4.5 In case of removable receptacle or pan, it shall be numbered or otherwise identified with the machine to which it belongs, and every such part shall be so made and fitted that its operating position remains unchanged. For the purpose of this requirement the part or the receptacle shall be deemed to be readily removable if it can be removed without the use of a tool.

4.6 The extremity of the pointer shall not exceed 1·0 mm in width and shall be not more than 3·0 mm away from the graduations on the dial.

4.7 The dial shall be graduated into equal parts, and the interval between consecutive graduations shall be not less than 2 mm.

4.7.1 The weight corresponding to the interval between consecutive graduations shall not exceed the values given in Table 1.

4.7.2 When the graduation commences at a fixed load, the position of the pointer when there is no load, shall be clearly indicated by a zero mark.

4.8 When a spring balance is provided with an adjustable indicator, the range of adjustment shall not exceed 1 percent of the capacity of the spring balance, except in the case of spring balances used for mining purposes where it shall not exceed 2 percent.

4.9 Spring balances shall have a device incorporated in the design to prevent overloading.

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*General requirements for weighing instruments.

5. TESTS

5.1 In case of hanging type spring balances the prescribed limits of error shall not be exceeded when a load is placed at any position in the pan.

5.2 If the pan is in the form of a scoop and a load equal to half the capacity is placed at the farthest point from the centre of the scoop and a similar load at any other position, the spring balance shall be correct within the prescribed limits of error.

5.3 When the pan is not in the form of a scoop, the spring balance shall indicate within half the prescribed limits of error, if the centre of a load equal to half the capacity is placed on the pan anywhere within a distance from the centre equal to one-third of the greatest length of the pan, or if that pan has a vertical side against the middle of that side, the weight being entirely on the pan.

5.4 Each graduation shall be tested for accuracy.

5.5 The spring balance shall be correct whether the test is made by progressively increasing or decreasing loads, provided that, in either case the spring shall be allowed to vibrate before the reading is taken.

5.6 The balance shall be loaded to its capacity and the load maintained for a period of 24 hours after which it shall be removed. Four hours after removal of the load, the balance shall not show any permanent set. Further, when tested as stated in **5.5**, the balance shall record correct readings.

5.7 Spring balances shall not be tested for sensitiveness.

6. SEALING

6.1 Spring balances shall be fitted with a soft plug or stud to receive a seal and wherever practicable, this plug shall pass through the dial or frame. The plug or stud shall be so supported as to allow no risk or injury to the instrument.

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